

light frosts occurred in the northern part of the State, and the same condition occurred about a week later. Toward the close of the month high temperatures were reported in the great valleys of California, but, with the exception of the morning of the 30th, the winds were not particularly high.—*A. G. McAdie, Professor.*

PORTLAND, OREG., FORECAST DISTRICT.

The month in the North Pacific States was unseasonably cool, and frosts frequently occurred in eastern Oregon and southern Idaho which did great damage to fruit and gardens. Most of the frosts were forecast, but some occurred without warnings, due to its being impossible to accurately foretell the irregular movements taken by abnormal high pressure areas.

The annual flood crest in the Columbia River passed Portland on the 3d, with a stage of 20.8 feet. The river remained nearly on a stand for five days, and then slowly fell, passing below the danger line of 15 feet on the 20th. Forecasts of the daily stages for three days in advance for both Portland and The Dalles were made from the 1st until the 15th, when the announcement was made that the river would continue to fall at the rate of about three-tenths (0.3) of a foot a day during the next three days.—*E. A. Beals, Forecast Official.*

HAVANA, CUBA, FORECAST DISTRICT.

No general storm occurred in the West Indies during the month. During the second and third weeks excessive rains occurred over the greater part of Cuba, flooding lowlands, causing rivers to overflow, inundating contiguous lands, washing away crops, houses, stock, etc., and causing the loss of a few lives.—*W. B. Stockman, Forecast Official.*

RIVERS AND FLOODS.

The Missouri River, as is usual during the month of June, rose somewhat, but not to any unusual heights, no danger-line stages having been reported. The Missouri rise also caused a rise in the Mississippi River from Alton, Ill., to the mouth of the Ohio River. Above Alton, and below Cairo, Ill., the average stages were considerably lower than during May, 1901.

Over the Ohio watershed the rains were sufficiently timely and abundant to provide excellent navigable stages of water, averaging over 20 feet below the mouth of the Great Kanawha River. There was a moderate flood in the Great Kanawha on the 24th, the stage at Charleston, W. Va., reaching

30.9 feet, 0.9 foot above the danger line. This flood contributed an additional 10 feet to the Ohio below Point Pleasant, W. Va.

The James River and the rivers of South Carolina were high at times, and in several of the latter the danger lines were exceeded by several feet. Timely and accurate warnings of these floods were given. In the James River the danger lines were not quite reached, but in the vicinity of Richmond, Va., some inconvenience was caused in the lower portions of the city. The losses, however, were trifling, as the warnings were well heeded.

The highest and lowest water, mean stage, and monthly range at 137 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport on the Red.—*H. C. Frankenfield, Forecast Official*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	5, a. m.	53	109	11, p. m.	52	65	3,180	6.5	485	20.2
II.....	10, a. m.	54	114	13, p. m.	42	70	2,550	3.5	728	30.3
III.....	12, a. m.	54	114	15, p. m.	48	68	2,000	3.5	571	22.8
IV.....	16, a. m.	57	105	19, p. m.	45	75	2,000	3.0	667	27.6
Sums.....							9,700	16.5	2,451	102.1
Mean of 4 paths.....							2,425		608	25.5
Mean of 16.5 days.....									588	24.5
Low areas.										
I.....	1, p. m.	42	90	4, p. m.	46	60	1,780	3.0	593	24.7
II.....	1, p. m.	51	104	3, p. m.	38	97	800	1.0	800	35.3
III.....	3, a. m.	51	120	10, a. m.	49	64	3,500	7.0	500	20.8
IV.....	11, a. m.	37	105	13, a. m.	43	89	1,500	2.0	750	31.2
V.....	12, a. m.	33	82	14, a. m.	32	86	900	2.0	450	18.8
VI.....	13, a. m.	44	104	15, a. m.	43	79	2,650	5.0	530	22.1
VII.....	16, a. m.	33	84	18, p. m.	35	76	535	2.5	210	8.8
VIII.....	22, a. m.	44	88	24, a. m.	44	71	925	2.0	463	19.2
IX.....	24, a. m.	51	114	25, p. m.	50	97	520	1.5	347	23.8
X.....	31, p. m.	38	105	30, a. m.	48	68	2,100	2.5	840	35.0
XI.....	29, p. m.	41	109	*1, p. m.	47	84	1,350	2.0	675	28.1
Sums.....							16,850	30.5	6,357	264.8
Mean of 11 tracks.....							1,532		578	24.1
Mean of 30.5 days.....									552	23.0

*July.

Geo. E. Hunt, Chief Clerk Forecast Division.

CLIMATE AND CROP SERVICE.

By *JAMES BERRY*, Chief of Climate and Crop Service Division.

The following summaries relating to the general weather and crop conditions are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau.

[Temperature is expressed in degrees Fahrenheit and precipitation in inches and hundredths.]

Alabama.—The mean temperature was 78.5°, or 0.3° above normal; the highest was 103°, at Livingston on the 27th, and the lowest, 48°, at Riverton on the 1st. The average precipitation was 2.80, or 1.90 below normal; the greatest monthly amount, 5.88, occurred at Camp Hill, and the least, 0.46, at Marion.

Wind and hailstorms in central and northern counties during first half of month caused considerable local damage to crops; otherwise, conditions moderately favorable for farm work and crop growth.—*F. P. Chaffee.*

Arizona.—The mean temperature was 77.3°, or 3.8° below normal; the highest was 123°, at Mohawk Summit on the 23th, and the lowest, 30°, at Flagstaff on the 11th, 14th, and 15th. The average precipitation was 0.01, or 0.24 below normal; the greatest monthly amount, 0.34, occurred at Supai, while none fell at a great number of stations.

Generally favorable conditions for the development of crops obtained during the first part of the month, and the harvesting of wheat was in active progress in the lower agricultural valleys during the second de-